

Message Text

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TO USMISSION OECD PARIS

C O N F I D E N T I A L STATE 067299

EXCON

EO 11652: XGDS-1

TAGS: ESTC, COCOM, US, UR

SUBJ: US COMPUTER-CONTROLLED GEOPHYSICAL DATA PROCESSING
SYSTEM TO USSR - IL 1565

REFS: A. OECD PARIS 6868

B. OECD PARIS 6544

C. COCOM DOC(74)372

COMMERCE REPLIES AS FOLLOWS TO REFTELS:

IN ORDER TO ACCOMPLISH STANDARD PROCESSING OF VIBROSEIS DATA
WITH A MINICOMPUTER AS IS THE CASE OF THE US SUBMISSION, AN
ARRAY TRANSFORM PROCESSOR (ATP) IS ESSENTIAL. THE REASON
FOR THIS IS BECAUSE OF THE CROSS-CORRELATION PROCESS NECES-
SARY IN THE USE OF VIBRATORY TECHNIQUES. THIS IS A METHOD
WHEREBY A SIX-SECOND SWEEP OF FREQUENCIES IS INJECTED INTO
EARTH INSTEAD OF A SINGLE PULSE AS WOULD RESULT FROM A DYNA-
MITE SHOT. A DYNAMITE SHOT GIVES A SINGLE PULSE WHEREBY
THE SIX-SECOND VIBRATOR SWEEP MUST BE REDUCED TO A PULSE
BY THE USE OF CROSS-CORRELATION TECHNIQUES.

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WITHOUT THE ATP IT WOULD BE DIFFICULT FOR THE MINICOMPUTER

TO PROCESS THE DATA RECORDED FROM EVEN ONE OIL EXPLORATION CREW. THE ATP IS USED IN THE FOLLOWING PROCESSES, NONE OF WHICH ARE IN REAL TIME. THE PROCESS TIMES ARE GIVEN ON THE BASIS OF A SIX-SECOND FIELD RECORDING.

A. DEMULTIPLEX - USING ATP REQUIRES 12 SECONDS. WITHOUT THE ATP REQUIRES 23 SECONDS.

B. CROSS-CORRELATION - USING ATP REQUIRES 25 SECONDS. WITHOUT THE ATP REQUIRES 250 SECONDS.

C. DE CONVOLUTION - USING ATP REQUIRES 30 SECONDS. WITHOUT ATP REQUIRES 60 SECONDS.

THEREFORE, FOR THESE THREE PROCESSES ASSOCIATED WITH THE VIBROSEIS METHOD OF OIL EXPLORATION A SIX-SECOND FIELD RECORD REQUIRES 67 SECONDS WITH AN ATP AND 333 SECONDS WITHOUT AN ATP. ADDITIONAL PROCESSES IN A SIX-SECOND FIELD RECORD ANALYSIS REQUIRE 48 SECONDS WITH ATP RESULTING IN A TOTAL OF 116 SECONDS, MINIMUM; OR ABOUT 20 TIMES REAL TIME. WITHOUT ATP TOTAL MINIMUM PROCESS TIME IS 450 SECONDS FOR EACH SIX-SECOND RECORD OR ABOUT 75 TIMES REAL TIME.

IT IS APPARENT FROM THE ABOVE THAT THE ATP DOES NOT GIVE THE SYSTEM TRUE REAL TIME CAPABILITY, BUT MORE APPROPRIATELY ALLOWS THE SYSTEM TO BE USED IN THE REDUCTION AND ANALYSIS OF DATA FROM MORE THAN ONE FIELD CREW, AND MAKES PROCESSING MORE ECONOMICAL.

IN THE EVENT THAT PC'S ASK FOR AN EXPLANATION OF THE TERM "VIBROSEIS", WHICH IS WELL UNDERSTOOD IN THE INTERNATIONAL OIL EXPLORATORY COMMUNITY, THE US DEL MAY WISH TO USE THE FOLLOWING:

THE VIBROSEIS METHOD IS A TECHNIQUE USED IN OIL EXPLORATION DEVELOPED BY THE CONTINENTAL OIL COMPANY, AND HAS GAINED POPULARITY ALL OVER THE WORLD FOR OIL EXPLORATION WORK IN AREAS OF HIGH AMBIENT NOISE. BECAUSE OF THE SIX-SECOND SWEEP, AND THE CROSS-CORRELATION TECHNIQUES, REFLECTION SIGNALS FROM GEOLOGICAL STRATA ARE ABLE TO BE

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SEEN THROUGH HIGH AMBIENT NOISE. RUSH

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